

The **A B C**s of Unified Serial™ Architecture for SATA and SAS

Begin With The Basics

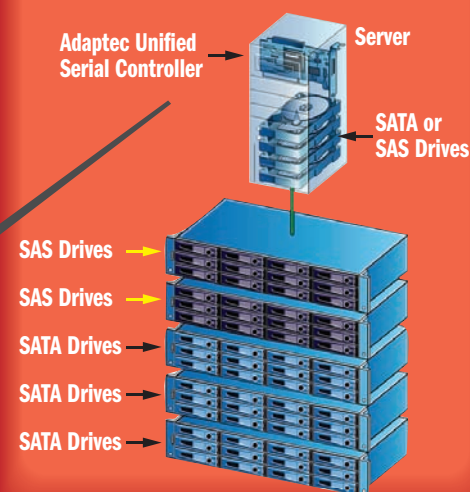
What is Unified Serial™ Architecture?

Unified Serial Architecture optimizes the performance, scalability and reliability of low-cost, high-capacity Serial ATA (SATA) storage. In addition, it allows an HBA or RAID controller to connect to both SATA and high-performance Serial Attached SCSI (SAS) drives – making it possible to use either, or both, in a single system. And, changing from SATA to SAS storage, or vice versa, is as simple as swapping out the drives.

Why Do We Need It? Unified Serial Architecture gives you the ultimate in storage flexibility. Use it now with SATA drives for increased performance, scalability and reliability. Or, use it with SAS drives for maximum performance and reliability. For expanding a SCSI infrastructure, simply install a Unified Serial controller in your server and as your data grows, take advantage of massive scalability up to 128 devices, or up to 60TB (using 500 GB drives) with a single controller.



Example of tiered storage built on Unified Serial™ Architecture



One Storage Architecture: Endless Possibilities

Drive Type	Using Unified Serial Architecture	Benefits
SATA	Get the most from your low-cost, high-capacity SATA drives	<ul style="list-style-type: none">• Maximum scalability up to 128 devices (up to 60 TB using 500 GB drives)• Improved reliability and performance• Investment protection, since upgrading to SAS in the future only requires swapping disks
SAS	Create very high-performance solutions Migrate an existing SCSI storage solution, by installing a Unified Serial controller and using SAS disks	<ul style="list-style-type: none">• Provides maximum performance• Takes full advantage of SAS reliability and scalability• Protects your existing SCSI investment• Provides more than 8 times the total scalability of SCSI, 128 devices instead of 15 (up to 60 TB using 500 GB drives)
SATA and SAS	Create tiered storage using a single storage system	<ul style="list-style-type: none">• Lowers your cost, since there's no need to maintain two separate storage infrastructures• Enables massive scalability, incrementally as your data grows (up to 60 TB using 500 GB drives)• Simplifies reallocating primary and secondary storage – just swap disks

Still Have Questions? Ask the Storage Advisors at <http://storageadvisors.adaptec.com>

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The **ABC**s of Unified Serial™ Architecture for SATA and SAS



Compare Drive Types

Type	Advantages	Disadvantages
SATA	Low Cost High Capacity	Lower Reliability
SAS	High Performance High Reliability	Higher Cost Lower Capacity

Increase Reliability

Most Adaptec Unified Serial controllers include RAID 6 as a standard feature. RAID 6 enables data to survive two simultaneous drive failures.

Compare Controller Types

Type	Characteristics
SATA Controller	<ul style="list-style-type: none">• Transfers data at 3 Gb/s• Scalability limited to one drive per port, so 8 drives for an 8-port board, 16 drives for a 16-port board, etc.• Can only connect to SATA drives• No upgrade path
Unified Serial Controller	<ul style="list-style-type: none">• Transfers data at 3 Gb/s• Handles SATA commands just as well as a SATA-only controller• Connects to both SATA and SAS drives• Scalable to 128 storage devices per port, using expanders (up to 60TB using 500GB drives)• Provides easy upgrade & storage reallocation

Glossary

Expander. Instead of connecting a disk drive to a single port on a Unified Serial controller, an expander can be connected. This is a switch which can connect up to 128 devices (disk drives, JBODs, other expanders, etc.)

RAID. Stands for Redundant Array of Inexpensive Disks, a method of logically combining several hard drives into one unit. It can offer improved fault tolerance and higher throughput levels than a single hard drive or group of independent hard drives. (See the ABCs of RAID)

RAID 6. Also called Dual Drive Failure Protection, it provides double redundancy and the ability to sustain two simultaneous drive failures.

SAS. Stands for Serial Attached SCSI. The next generation of the SCSI interface (see SCSI below), it combines the reliability and stability of SCSI with higher performance, reliability, and scalability.

SATA. Stands for Serial ATA. The next generation of the Parallel ATA interface (PATA), it offers thinner and longer serial cabling and fewer interference issues than PATA, along with low cost and very large drive capacities.

SCSI. Stands for Small Computer System Interface. For over 20 years, SCSI, also known as "parallel SCSI" has been the technological standard for connecting various devices to your server or PC, using a SCSI HBA or RAID controller that fits inside your computer.

Storage reallocation. When you have established a storage strategy, such as the tiered storage strategy described below, re-allocation is the process of re-assigning storage away from its original designation (primary or secondary) to meet changing business needs.

Tiered storage. A storage strategy in which different types of media are used to store different types of data to balance cost and protection. Typically, this means storing the most mission-critical, or valuable, data on the highest-performance, most reliable (and usually most expensive) disks, called primary storage. Data that is less valuable, or can be re-created, is stored on higher volume, lower cost disks, called secondary storage.

For more information check out:

www.adaptec.com/abc

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